# जनवरी / January 2022

Issue **23** 











... कृषि तकनीकी समन्वय पत्र





भाकृअनुप – राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान ICAR-NATIONAL INSTITUTE OF ABIOTIC STRESS MANAGEMENT बारामती, पुणे - 413 115, महाराष्ट्र, भारत Baramati, Pune – 413 115, Maharashtra, India

# Farm Coordinator (Issue 23) January 2022

## Published by

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# FARM COORDINATOR

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#### निदेशक के लेखनी से...

पिछले दो महीनों के दौरान चक्रवाती परिस्थितियों और सामान्य से अधिक तापमान की पृष्ठभूमि पर जनवरी 2022 ने ठंड के मौरम का वास्तविक अनुभव प्रदर्शित किया। जनवरी के अंतिम सप्ताह में उत्तर से शीत तहर के बीच न्यूनतम तापमान 9.3°C दर्ज किया गया था। कुछ दिनों तक धूल भरी आंधी भी वली, जिससे दिन के तापमान में गिरावट आयी। इस वर्ष, जैसा कि नियासम परिसर में अनुभव किया गया है, महाराष्ट्र के अधिकांश हिस्सों में आम का देर से फूलना देखा गया है। उस पर देरी से हुई बारिश, हल्की सर्दी और बागवानी तरीकों के प्रभाव का पता लगाने की जरूरत है। इसके अलावा, विलंबित फसल का रखरखाव एक नई चुनौती होगी।

'प्रक्षेत्र समन्वयक' का यह अंक विभिन्न रबी फसतों जैसे पारंपरिक गेढुं, चना, अरहर और नई फसतों जैसे किनोआ, चिया और सब्जियों में रखरखाव गतिविधियों का दस्तावेजीकरण करता है। यह संतरे और शरीफा में बहार प्रबंधन गतिविधियों, अंगूर में बेरी थिनिंग, आम, अंगूर और अनार में पौध सूरक्षा का भी वर्णन करता है। साथ ही 'मलद फार्म' की गतिविधियां तेज हो रही हैं। अगले महीने के लिए कई और कार्यों की योजना बनाई गई हैं, जिसमें खेत की फसतों की चनिंदा कटाई, बगीचों में छंटाई गतिविधियाँ और मलद फार्म में सिंचाई के लिए पानी की सुविधा विकसित करना शामिल हैं। आने वाली चूनौतियों के संबंध में, गर्मियों में नहर बंद होने के दौरान पानी की कमी, अंगूर के साथ-साथ ड्रैंगन फ्रूट में सनबर्न के लक्षण और आम में जल्दी फल गिरने जैसे मुद्दों की आशंका पर शमन रणनीति की योजना बनाने का मौका देगी। संदर परिसर के कुशत रखरखाव के लिए लैंडरकेप बागवानी की मूल बातों पर ध्यान देना अच्छा होगा।

'प्रक्षेत्र समन्वयक' वास्तव में गतिविधियों को प्रस्तुत करने, उपलब्धियों का आकलन करने और भविष्य के लक्ष्यों के लिए योजना बनाने में महत्वपूर्ण भूमिका निभा रहा है। मुझे पूरी उम्मीद हैं कि इस प्रयास से नियासम और अन्य जगहों पर अनुसंधान प्रक्षेत्र प्रबंधन में सुधार होगा। इस प्रकाशन को नियमित रूप से प्रकाशित करने के लिए डॉ. प्रवीण तावरे और उनकी टीम को उनके समर्पण और निरंतरता के लिए, मैं धन्यवाद देता हूं।

# From Director's Desk...

January 2022 displayed a real feel of cold season on the background of cyclonic conditions and temperatures more than normal during the previous two months. The minimum temperature was recorded to be 9.3°C amid



cold wave from north during the last week. A dust storm was experienced for couple of days, causing reduction in day temperature. This year delayed flowering has been seen in mango in most of the parts of Maharashtra as also experienced at the campus. The impact of delayed rains, mild winter and cultivation practices on it, need to be explored. The maintenance of delayed crop will be a new challenge.

This issue of 'Farm Coordinator' documents the maintenance activities in various rabi crops like traditional wheat, chickpea, pigeon pea and new crops like quinoa, chia and vegetables. It also narrates bahar management activities in sweet orange & custard apple, thinning in grape, plant protection in mango, grape and pomegranate. 'Malad Farm' activities are taking pace. Many more actions have been planned for next month, which include selective harvesting of field crops, pruning activities in orchards and developing irrigation water facilities at Malad Farm. Regarding the challenges ahead, early prediction of issues like water shortage during canal closure in summer, sunburn symptoms in grape, dragon fruit and early fruit drop in mango will give chance to plan for mitigation tactics. A focus on basics in landscape gardening will be good for efficient maintenance of beautiful campus.

'Farm Coordinator' is really playing a crucial role in presenting the activities, assessing achievements and planning for future targets. I sincerely hope that this effort will improve research farm management in NIASM and elsewhere. I thank Dr. Pravin Taware and the team for their dedication and sincerity in bringing out this publication very regularly.

हिमांश् पाठक / Himanshu Pathak

जनवरी/ January 31, 2022

#### Farm Coordinator

- The *rabi* crops sowing was completed during last month. However, some sowing date treatment imposition was continued in chickpea, wheat, chia and quinoa crop fields. Simultaneously facilitated the treatment activities through irrigation, providing manpower and other resources as per the requirement.
- General irrigation and weed management activities were carried out in all the fields as per the work indents.
- Looking in to cloudy weather and some pod borer infestation spraying of Carbendezim and Fipronil was carried out in chickpea.
- Kharif crops like pigeon pea were at harvesting stage which was carried out on demand from the respective project leaders. Soybean and sunflower produce was sent to APMC market for sale and revenue generation.

#### **Orchard management:**

- Sweet orange and custard apple fields were left for rest with moisture stress to initiate fresh *bahar*.
- Thinning of grape berries from tight bunches was carried out manually with the help of pointed scissors. Pruning of excess shoots in dragon fruit was competed for developing canopy structures as per treatment requirements.
- Irrigation and nutrition management: Farm yard manure application in pomegranate and mango orchard was chemical continued and fertilizer application carried was out in pomegranate, mango, grape and sapota to fulfil nutritional requirements. Water soluble fertilizers were supplied through fertigation to fulfil immediate nutritional requirements in these orchards. Foliar application of Sulphate of potash, Magnesium sulphate and Calcium nitrate was carried out in grape and sapota for nutritional purpose and in mango for enhancing flowering.
- Control of powdery mildew in grape was essential. Spraying of Hexconazole, Myclobutanil along with Mono-potassium phosphate was carried out twice. Tiamethaxam was used in mango to protect inflorescence from hoppers.
- Weed management was achieved by using machinery and through manual weeding.



#### Malad farm activities:

- To resolve irrigation water issues at Malad farm a field visit was arranged along with Irrigation staff and the local society dealing with the tertiary running along the farm. Plan of action was defined and accordingly letter was sent to get water from canal. Other proposals for development of storage facility and irrigation network were submitted to initiate the work.
- The chickpea crop sown during *rabi* season was in good condition. Manual weeding was carried out to control weed growth. No irrigation required due to rains due to cyclone effect at critical growth stages.

#### Campus cleaning & landscape maintenance:

- Lawn maintenance: Lawn maintenance in view of celebration of Republic Day was given priority. Along with lawn cutting, the hedge and edge cutting was completed. New lawn area has been developed in Naxatra Udyan along with development of walking paths by spreading murrum.
- Harvesting of tender nuts from peripheral plantation and trunk cleaning by removing dried leaves was carried out as a regular task. One round of manual weeding followed by soil pulverizing was done to maintain the roadsides clean.
- As a part of general cleaning *Parthenium* eradication movement was done under Swatch Bharat program.

The long period average (LPA) of January rainfall and average temperature at Baramati is 0.6 mm and 22.0 °C, respectively. The details of weather during the January 2022 has been listed in Table 1 and depicted in following figure.

Weather	Week				Monthly	Mox	Min
Parameters	1 <sup>st</sup>	$2^{nd}$	3 <sup>rd</sup>	4 <sup>th</sup>	Montiny	Max.	MIII.
T Max (°C)	28.1	27.9	27.7	26.9	27.8	31.8	23.6
T Min (°C)	14.5	14.0	12.6	11.5	12.8	18.4	9.3
T Avg (°C)	21.3	20.9	20.2	19.2	20.3	23.1	16.7
RH Mean (%)	68	68	68	65	66	82	54
WS (km/h)	4.1	4.4	3.8	5.7	4.5	9.0	2.9
BSS (h)	4.1	5.7	6.2	7.6	6.3	10.0	1.3
Total PE (mm)	20.7	25.3	22.2	33.0	112.5	6.3	1.9
Total Rain (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Table 1.** Summary of weather variables recorded during January, 2022.



**Fig 1.** Variations of daily rainfall (Rain), pan evaporation (PE), mean temperature  $(T_{Avg})$  and bright sunshine hours (BSS) during January, 2022 at ICAR-NIASM Baramati.



- The *rabi* crops being at grand growth stage, its good care for irrigation will be mandatory. Simultaneous weed management will required to be taken care of. Some of the field will be at maturity where selective harvesting to be carried out as per experimental needs.
- Technical support for field research: Fulfilling requirements of field research through manpower and resource distribution for treatment imposition and general maintenance will be the priority.

#### **Orchard management:**

- Pruning activities: Pruning in sweet orange before starting irrigation for fresh bahar will be completed. Pruning is required for skirting (removal of lower branches), opening up (removal of entangled and overlapping branches inside the canopy) and hygiene (removal of diseased branches) purpose. Pruning in Ber will be to keep only 3-4 bud stem to allow new shoot growth for flowering and new season crop. Pruning in custard apple is required for better light penetration to warm up each cane or branch.
- Installing lighting system for dragon fruit: Dragon fruit is long day herb and to study the effect increase light period through artificial lighting, a system to be installed and used from mid-February.
- Plant protection: The sunburn experienced in grape and dragon fruit is of different types. In case of grape bunch open to sky, berry browning is observed which can be prevented by covering the bunch with canopy. Dragon fruit leaf burning in hot sun need to be prevented by shading and minimizing irrigation.
- In mango, delayed flowering has been experienced this year. Frequent cloudy conditions change in weather need to change strategy for increasing fruit set and protection from pest and diseases. Hoppers, fruit flies and powdery mildew will be big threat during this period that is to be managed with thorough plant protection.

#### Malad farm activities:

 Developing assured irrigation facility for Malad Farm is a pre-requisite for intensifying field research work. Accordingly water storage pond, irrigation distribution network and drip irrigation system laying work will be a target for next few months.



#### Garden maintenance & other activities:

- Maintenance of coconut trees and other peripheral plantations will continued by training-pruning, weeding and soil pulverizing. Gaps will be filled with Nagpur Orange shrubs from orchard rejuvenation.
- Reuse of back wash water of filtration from pumping house will be recycled on sedimentation. The work of creating a small storage tank for this purpose will be completed in this month.

#### **Challenges Ahead**

#### Meeting water requirements during canal closure

The various plantation at campus have grown up and almost all arable area has been brought under cultivation that demands more water inputs. During summer. the requirement of water for irrigation as well as utility will be at peak. Further, it is being predicted that the canal closure period will increase in future due to reduction in water share for 'Left NIRA Canal'. Although due to enhanced storage facility it can be managed to greater extent,

#### Sunburn issues in grape & dragon fruit

- Sunburn in grape is reported when the canopy is sparse and some bunches may remain open to sky. The portion of bunch, continuously in scorching sunlight especially veraison and during near maturity, exhibits browning burnt or symptoms. Sometimes, such berries may crack and become prone to pest infestation and rotting. Discoloration of few berries in a bunch is not preferable in market. To avoid this the shoot arrangement need to be fixed so as to keep the bunch in canopy shadow. Covering individual bunch with paper bags may also be one of the solution. To retain very good uniform colour of bunch green shade-net covers are also used.
- In case of dragon fruit, in bright sunlight along with high temperatures (>35°C), the shoots undergo sun-burning. Being CAM plant, its stomata remain closed during day time which hinders in cooling mechanism. It is one of the mechanism of conserving moisture stored in fleshy leaves. The water inside the leaf gets heated in sun, which • increases temperature to such extent that it leads to tissue necrosis. This may also lead to secondary infections causing rotting of • the fleshy tissues. The sunburn is supposed to be more in heavily irrigated conditions. So the control on irrigation is primary solution.



the available water resource need to be utilized very wisely. Most of the orchard, landscape garden, avenue and peripheral plantations micro-irrigation. are under Gradually some field crops are also being brought under drip and sprinkler system. This is going to help in efficient utilization of irrigation water. However, meticulous scheduling and water budgeting is must to tackle the issues of water shortage during longer canal closure period.



Sunburn issues in grape



#### Mango fruit drop issues

- This year delayed flowering in mango has been experienced. It is found that some trees are still getting flowers.
- As the temperature starts increasing, due care of soil moisture is required to increase fruit set and reduce early fruit drop. Too much water during flowering will lead to poor fruit set while water scarcity after fruit set will lead to early fruit drop. Therefore, maintaining optimum moisture levels is a pre-requisite for good yield.
- The predictions of bad weather conditions keep open the threat of hopper infestation and powdery mildew infection. Spraying of Deltamethrin or Azadiractin and Hexaconazole or Wettable Sulphur will be required at frequent intervals to increase the fruit set.

#### Landscape Gardening Activities at Campus

Lawn is an integral part of any landscape gardening. The area meant for lawn should be chosen looking into its utility and aesthetic purpose. Following points should be kept in mind before selecting and developing the site.

- Though the common lawn grass or doob Selection of grass: The widely used grass desirable to have a fertile, loamy soil containing enough humus.
- The ideal pH range is 5.5 to 6.0. In alkaline establish immediate turf. soil, gypsum or bentonite sulphur to be obtaining a good lawn establishment.
- Grasses are shallow-rooted. so deep drainage is not necessary, but there should not be water stagnation in the rooting zone.
- Maintaining desired level of surface is a prerequisite and should be done prior to lawn bed preparation.
- If the native soil is as per requirement, deep pulverization of soil can serve the purpose. But if soil conditions are not proper, 25 to 30 cm layer is to be removed and filled with good quality garden soil.
- While digging remove stones, tough clods, old masonry, grass roots, etc. Perennial grasses like nut grass (*Cyperus rotundus*) should be destroyed by using herbicides or to be removed by deep digging.
- Starting this activity during the hot months of April and May helps to kill weeds and pests in scorching sunlight.
- The soil should be manured with well decomposed material. The manure is to be sieved and spread over the surface at the rate of 500 Kg per 100 sqm area followed by fine pulverizing up to 15-20 cm depth.
- After this soil need to be watered thoroughly & remove weeds growing if any.
- The final levelling is done when the soil is sufficiently dried up. Maintain the level of the lawn 5 cm below the levels of paths and drives so as to keep the paths dry when the lawn is flooded with water.
- The slopes and mounds in a lawn should be gradual and artistic, considering the native landscape.
- Installation of irrigation system to be done at this stage only to avoid any disturbances in levels after lawn establishment. Pop-up sprinklers are generally preferred for lawn areas.

grass is hardy and can grow on any type of under Indian conditions is the doob grass or soil, to obtain a luxuriant lawn, it is Bermuda grass or American grass (Cynodon dactylon). The grass thrives well under hot, sunny weather. Korean carpet grass is used to

Methods of planting: The different methods used at the time of early preparations. oil for starting a lawn are in practice viz., seed depth of 25-30 cm is desirable for sowing, dibbling, turfing and turf-plastering. But most common are dibbling and turfing.

> **Dibbling:** After the land is ready, well-matured both unrooted and rooted doob grass cuttings from a lawn-scraping are dibbled in the moist surface at 7-10 cm spacing. Roots of doob grass sprout easily and the cuttings or offshoots root readily under moist condition and within 5-7 weeks the grass will be ready for first cutting. By this method a lawn will be ready in about four months.

> Turfing: This is the quickest method of lawn establishment but fetches high costs. Turf is available in 0.3 m x 1 m rolls with a piece of earth of about 5 cm thickness. These strips are laid on the moist soil surface close to each other and firmly pressed by beating with wooden plank or a vibrator machine. The grass is immediately watered thoroughly.



Glimpses of the Month



#### प्रगति के पथ पर

लैंडरकेप गार्डन और बागान पौध, आईसीएआर-नियासम परिसर के अभिन्न और सौंदर्यपूरक घटक हैं। बागवानी की मूल बातें सीखना इस सौंदर्यवाद की योजना बनाने और बनाए रखने तथा चारों ओर सकारात्मक कार्य वातावरण विकसित करने में सहायक होगा। कार्य सूची के बेहतर प्रबंधन के लिए गहन जानकारी प्राप्त करने हेतु हमने पिछले अंक से ही इस पहलू पर ध्यान देना शुरू किया है। लॉन की स्थापना एवं रखरखाव सावधानीपूर्वक योजना और प्रबंधन को आकर्षित करता है।

फसल की खेती के तरीकों के प्रबंधन के अलावा. विभिन्न संसाधनों के माध्यम से अनुसंधान प्रक्षेत्र प्रबंधन में तेजी लाने की जरूरत हैं। ऐसा करते समय खेत के कर्मचारियों को मंच पर और पर्दे के पीछे भी भूमिका निभानी होती हैं। संसाधन प्रबंधन से संबंधित कई गतिविधियाँ हैं जिसमे संसाधनों को उपलब्ध कराने, और बनाए रखने के लिए बहुत सारी क्रियाओं की आवश्यकता होती हैं। भौतिक आदानों के मामले में, जैसे बीज, खाद, उर्वरक, कीटनाशक आदि की मौसमी आवश्यकताएं होती हैं। इन आदानों की अस्थायी आवश्यकता को कम करना. समय पर खरीद और मांगों को पूरा करने के लिए भंडारण का रख-रखाव आवश्यक होता हैं। जुताई के उपकरण, मशीनरी, औजारों का रस्वरस्वाव भी एक महत्वपूर्ण कार्य हैं। अनुसंधान उद्देश्य, कार्य सटीकता और समय प्रबंधन के लिए जुताई संचालन जरूरी हैं। खेत में अनुसंधान की मांगों को पूरा करने के लिए, कृषि मभीनरी और उपकरणों को किसी भी समय उचित कार्यभील रिथति में बनाए रखने की आवश्यकता होती है। सिंचाई स्विधाओं में, सिंचाई समय-निर्धारण के साथ-साथ पमिपंग प्रणाली और पाइपिंग नेटवर्क का रखरखाव महत्वपूर्ण है। खेत में बुवाई के तुरंत बाद और फसत के मौसम में जब भी आवश्यकता हो सिंचाई उपलब्ध कराने की स्थिति में होना चाहिए। सीमित सिंचाई और इसकी मात्रा का निर्धारण भी सुगम बनाया जा सकता है। खेत पौधों की सुरक्षा के लिए विभिन्न प्रकार के स्प्रेयर से सुसज्जित हैं, जिसे इष्टतम प्रदर्शन के लिए अच्छी स्थिति में बनाए रखने की आवश्यकता होती हैं। इसलिए, सामग्री प्रबंधन और मशीनरी रस्वरस्वाव गतिविधियां अनुसंधान प्रक्षेत्र प्रबंधन में प्रगति के लिए निरंतर योजना का महत्वपूर्ण हिस्सा हैं।

#### **Plan For Progress**

Landscape garden and various plantations are the integral and aesthetic components of ICAR-NIASM campus. Learning basics of gardening will be maintaining helpful in planning and this aestheticism and developing positive work environment all around. We started focusing on this aspect from previous issue for getting deep knowhow for better management of work calendar. The establishment and maintenance of lawn attracts careful planning and management.

Besides the management of crop cultivation practices, research farm management needs to expedite through various resources. While doing this, the farm staff has to play role on dais and behind the curtain as well. There are many activities related to resource management where lot of actions are required to create, retain and keep the resources available. In case of material inputs, like seeds, manures, fertilizers, pesticides, etc. have seasonal requirements. Chalking down tentative requirement of these inputs, timely procurement and up-keeping of farm store to fulfill demands, is essential. Maintenance of tillage equipment, machinery, tools is also an important task. The tillage operations for research purpose, work precision and time management are the prerequisites. To meet the research demands at field, the farm machinery and tools need to be maintained in proper working condition at any given time. In irrigation facilities, maintenance of pumping system and piping network along with irrigation scheduling is important. Farm should be in position to provide irrigation immediately after sowing and as and when required during crop season. Restricted irrigation and its quantification could also be facilitated. Farm is equipped with different type of sprayers for plant protection, which need to be maintained in good condition for optimum performance. Therefore, material management and machinery maintenance activities are part and partial of the continuous plan for progress in research farm management.

